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„Progressive Web Apps – Case study”

Roadmap

1. **Introduction**
2. Fundamentals
3. Performance
    - Offline support
4. Optional
    - Push notifications

„Progressive Web Apps”

Google Developers

PROGRESSIVE WEB APP

DEV SUMMIT 2016

Progressive Web Apps are **user experiences** that have the reach of the web, and are:

- **Reliable** – Load instantly
- **Fast** – Respond quickly to user interactions
- **Engaging** – Feel like a natural app on the device

https://developers.google.com/web/progressive-web-apps/

Native App

- Adds to user’s Home screen
- Render without browser
- Startup instantly
- Work offline
- Push notifications

Mobile web

- Easy to find
- Easy to access
- No installation required
- Compatible between devices

https://developers.google.com/web/tools/lighthouse/

Elements Console Sources Network Performance Memory Application Security Audits ObservePoint Redux Adblock Plus EditThisCookie

Audits help you identify and fix common problems that affect your site's performance, accessibility, and user experience. Learn more

Perform an audit...

Chrome > DevTools > Audits > Perform an audit

Console

top Filter Default levels

- [ ] Hide network
- [ ] Preserve log
- [ ] Selected context only
- [ ] User messages only
- [ ] Log XMLHttpRequests
- [ ] Show timestamps
- [x] Autocomplete from history

45	56	83	62
Progressive Web App	Performance	Accessibility	Best Practices

Progressive Web App

45

These audits validate the aspects of a Progressive Web App, as specified by the baseline PWA Checklist.

6 failed audits

- Does not register a Service Worker ✕
- Does not respond with a 200 when offline ✕
- Does not provide fallback content when JavaScript is not available ✕
  The page body should render some content if its scripts are not available.
- User will not be prompted to Install the Web App ✕
  Failures: No manifest was fetched, Site does not register a Service Worker, Manifest start_url is not cached by a Service Worker.
- Is not configured for a custom splash screen ✕
  Failures: No manifest was fetched.
- Address bar does not match brand colors ✕
  Failures: No manifest was fetched, No `<meta name="theme-color">` tag found.

5 Passed Audits

Manual checks to verify

Performance

56

These encapsulate your app's performance.

Metrics

These metrics encapsulate your app's performance across a number of dimensions.

1.1 s | 2.1 s | 3.2 s | 4.3 s | 5.3 s | 6.4 s | 7.5 s | 8.6 s | 9.6 s | 10.7 s

Overview
Progressive Web App Checklist

Progressive Web App Checklist

Progressive Web Apps (PWA) are reliable, fast, and engaging, although there are many things that can take a PWA from a baseline to exemplary experience.

To help teams create the best possible experiences we've put together this checklist which breaks down all the things we think it takes to be a Baseline PWA, and how to take that a step further with an Exemplary PWA by providing a more meaningful offline experience, reaching interactive even faster and taking care of many more important details.

Baseline Progressive Web App Checklist

developers.google.com/web/progressive-web-apps/checklist

testing sites.

Site is served over HTTPS	
To Test	Use Lighthouse to verify **Served over HTTPS**
To Fix	Implement HTTPS and check out letsencrypt.org to get started.

Pages are responsive on tablets & mobile devices	
To Test	• Use Lighthouse to verify Yes to all of **Design is mobile-friendly** , although manually checking can also be helpful. • Check the Mobile Friendly Test
To Fix	Look at implementing a responsive design, or adaptively serving a viewport-friendly site.

Canonical URLs are provided when necessary
Pages use the History API
Content doesn't jump as the page loads
Pressing back from a detail page retains scroll position on the previous list page
When tapped, inputs aren't obscured by the on screen keyboard
Content is easily
across phone, tablet and desktop screen sizes
Any app install prompts are not used excessively
The Add to Home Screen prompt is intercepted
First load very fast even on 3G
Site uses cache-first networking
Site appropriately informs the user when they're offline
Provide context to the

Test cases

- **Private blog**
- Small and simple
- No target audience
- Playground
- React + Webpack

- **Commercial product**
- Targeted towards corporate clients
- Complex logic
- React + Redux + Webpack

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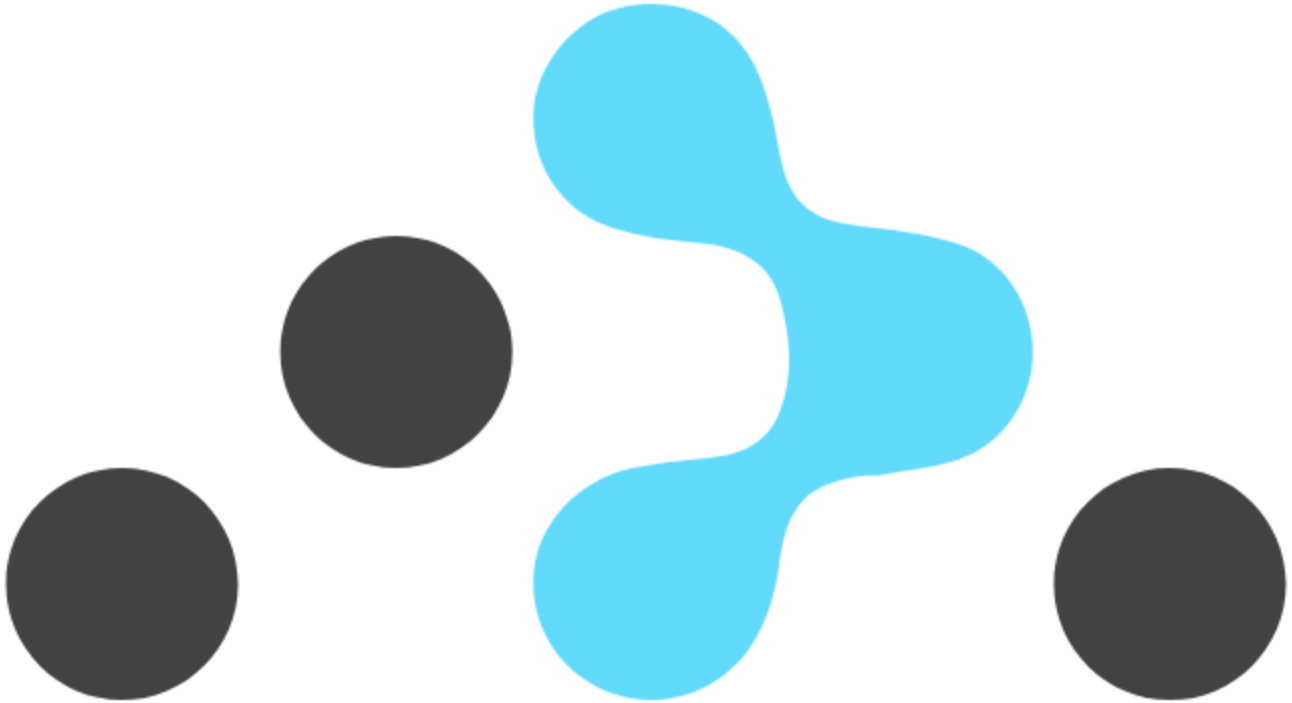
Baseline checklist

1. “Site is served over HTTPS”
2. “Site works cross-browser”
3. “Pages are responsive on tablets & mobile devices”
    - Google’s Mobile Friendly Test

      https://search.google.com/test/mobile-friendly

(4/8) „Each page has a URL”



react-router

```
1   export function Blog() {
2     return (
3       <BrowserRouter>
4         <Route exact path={RoutingProvider.getHomeNiceUrlBasePath()} component={HomeView}/>
5         <Route path={RoutingProvider.getAboutNiceUrlBasePath()} component={AboutView}/>
6         <Route path={`${RoutingProvider.getEntryNiceUrlBasePath()}/:niceUrl`} component={EntryView}/>
7         <Route path={`${RoutingProvider.getEntriesByTagNiceUrlBasePath()}/:tag`} component={EntriesByTagView}/>
8         <Route path={`${RoutingProvider.getEntriesByDateNiceUrlBasePath()}/:date`} component={EntriesByDateView}/>
9         <Route path={`${RoutingProvider.getErrorNiceUrlBasePath()}/:errorMessage`} component={ErrorView}/>
10      </BrowserRouter>
11    );
12  }
13
14  export default Blog;
```

```
export class App extends React.Component {

  //...

  render() {
    // ...

    return (
      <Switch>
        <Route path={getUrlWithBase('/listings/:id')} exact={true} render={redirectToNew} />
        <Route path={getUrlWithBase('/listings/:id/(new|kept|discarded)')} component={Listing} />
        <Route component={NotFound} />
      </Switch>
    );
  }
}

// ...

export default withRouter(connect(mapStateToProps, mapDispatchToProps)(App));
```

(5/8) “Metadata provided for Add to Home screen”

Web App Manifest

https://www.w3.org/TR/appmanifest/

https://developer.mozilla.org/en-US/docs/Web/Manifest

```
{
  "name": "soofka.pl",
  "short_name": "soofka.pl",
  "start_url": "/",
  "display": "standalone",
  "background_color": "#000131",
  "theme_color": "#000131",
  "description": "Personal blog of Jakub Sowiński",
  "icons": [{
    "src": "/images/soofka-icon-128-white.png",
    "sizes": "128x128",
    "type": "image/png"
  }, {
    "src": "/images/soofka-icon-256-white.png",
    "sizes": "256x256",
    "type": "image/png"
  }, {
    "src": "/images/soofka-icon-512-white.png",
    "sizes": "512x512",
    "type": "image/png"
  }]
}
```

x | Feature: Web App Manifest

Web App Manifest - WD

Global 59.76%

The web app manifest provides information about an application (such as name, author, icon, and description) in a JSON file, which browsers can use to give richer offline experiences.

Current aligned | Usage relative | Date relative | Show all

IE	Edge *	Firefox	Chrome	Safari	iOS Safari *	Opera Mini *	Chrome for Android	UC Browser for Android	Samsung Internet
			49		10.2				4
	15	56	61	10.1	10.3				5
11	16	57	62	11	11.2	all	62	11.4	6.2
	17	58	63	TP					
		59	64						
		60	65						

Notes | Known issues (0) | Resources (7) | Feedback

MS Edge status: In Development
Firefox status: in-development
WebKit status: In Development

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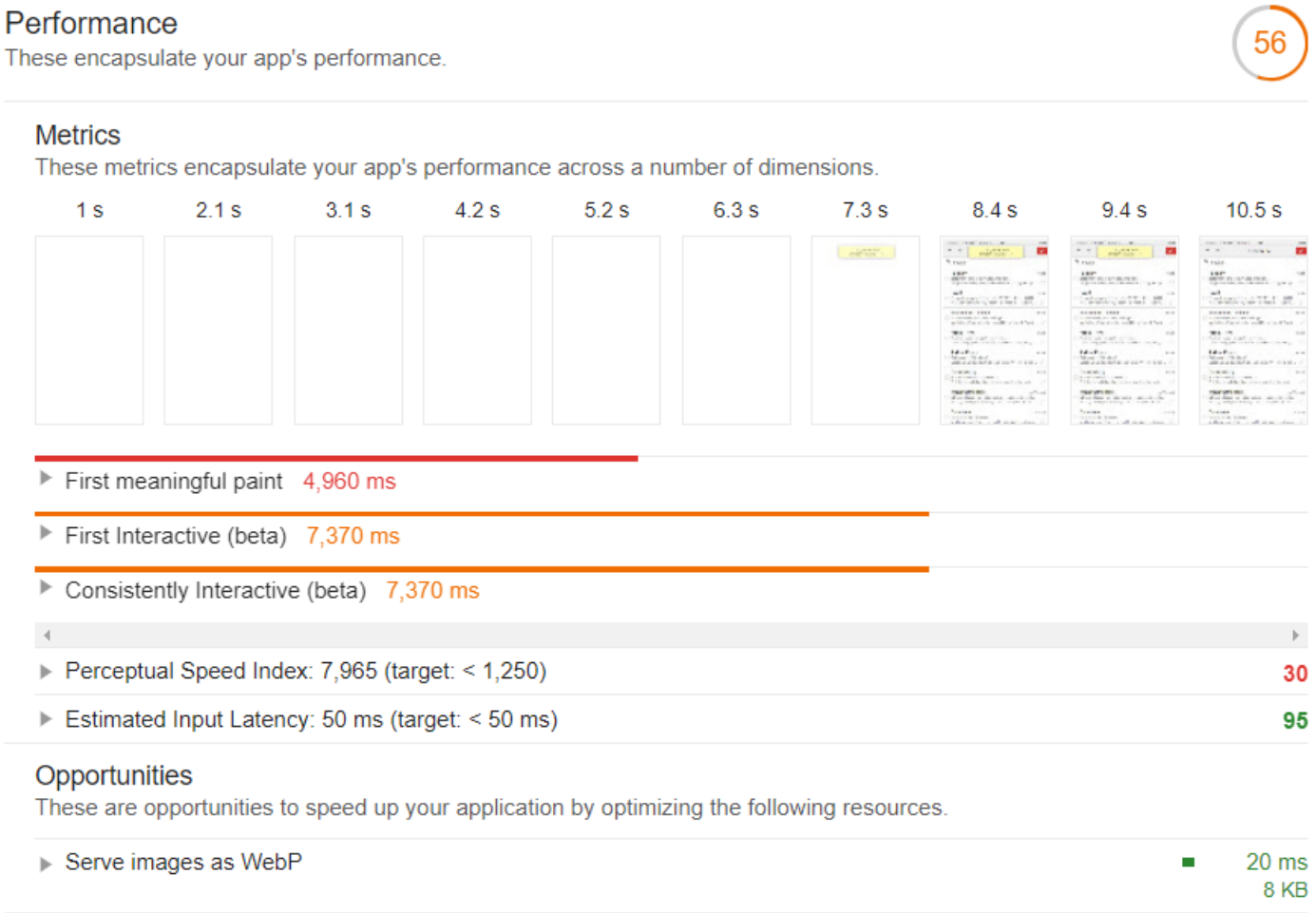
(6/8) „First load fast even on 3G”



time to interactive

< 10 seconds

for **first visit**

on a simulated

3G network

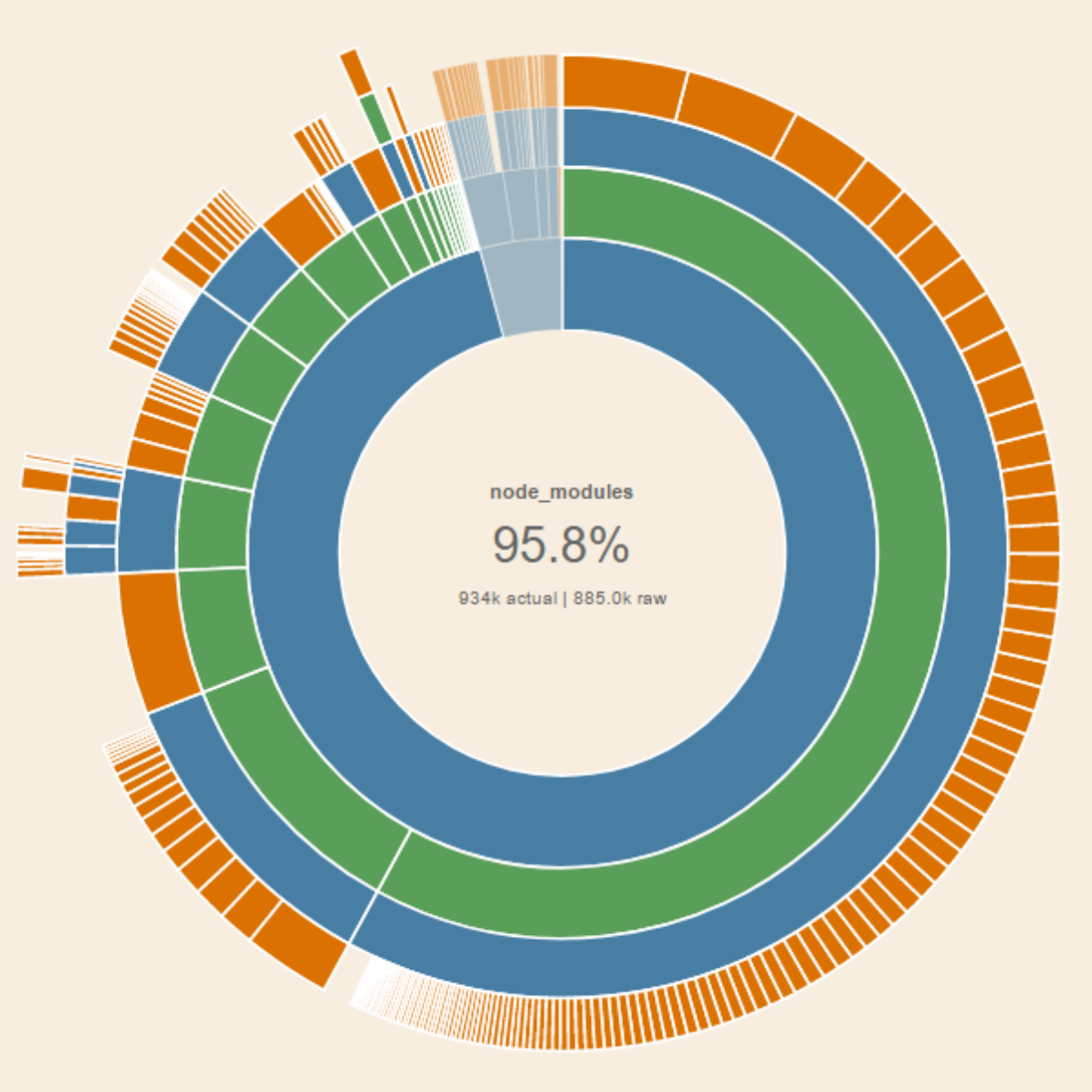
Minification/uglification

```
return {
    // ...
    "plugins": {
        // ...
        new webpack.optimize.UglifyJsPlugin({
            compress: {
                warnings: false,
                screw_ie8: true,
                conditionals: true,
                unused: true,
                comparisons: true,
                sequences: true,
                dead_code: true,
                evaluate: true,
                if_return: true,
                join_vars: true
            },
            output: {
                comments: false
            }
        }),
        // ...
    }
}
```

Result:

```
function(t){return n.call(t).slice(8,-1)}},function(t,e,n){"use strict";va
(t){return t.getIn(["app","lang"])},e.selectIsLoading=function(t){return t
"isLoggedIn"])},e.selectTabName=function(t){var n=e.selectPathname(t),i=r.
.location.pathname}},function(t,e,n){"use strict";Object.defineProperty(e,
{type:r.UPDATE_MODAL,payload:{newProps:t}}}},function(t,e,n){"use strict";
function(t){for(var e,n=1,r=arguments.length;n<r;n++){e=arguments[n];for(v
"function"==typeof Object.getOwnPropertySymbols)for(var o=0,r=Object.getOw
r(var o=0,r=Object.getOwnPropertySymbols(t);o<r.length;o++)e.indexOf(r[o])
{return r[t]||(r[t]=a&&i[t]||(a?i:o)("Symbol."+t))}).store=r},function(t,e
("function"==typeof(n=t.valueOf)&&!r(o=n.call(t)))return o;if(!e&&"functio
(t,e){var n=Math.ceil,r=Math.floor;t.exports=function(t){return isNaN(t=+t
(90),k=n(132),D=n(78),R=n(182),F=n(263),U=n(13),H=n(32),B=U.f,G=H.f,V=o.Ra
ct=z.reduceRight,ut=z.join,lt=z.sort,ft=z.slice,pt=z.toString,dt=z.toLocal
[1]).buffer)[0]}),St=!!J&&!!J.prototype.set&&i(function(){new J(1).set({})
constructor!");return new t(e)},Ct=function(t,e){return At(L(t,t[yt]),e)},
f=void 0!==l,p=C(s);if(void 0!=p&&!S(p)){for(a=p.call(s),r=[],e=0;!(i=a.ne
return n},Lt=!!J&&i(function(){dt.call(new J(1))}),Mt=function(){return dt
fill:function(t){return R.apply(Pt(this),arguments)},filter:function(t){re
0)},forEach:function(t){q(Pt(this),t,arguments.length>1?arguments[1]:void
lastIndexOf:function(t){return at.apply(Pt(this),arguments)},map:function(
```

Original: 975 KB



Minified: 235 KB -76%

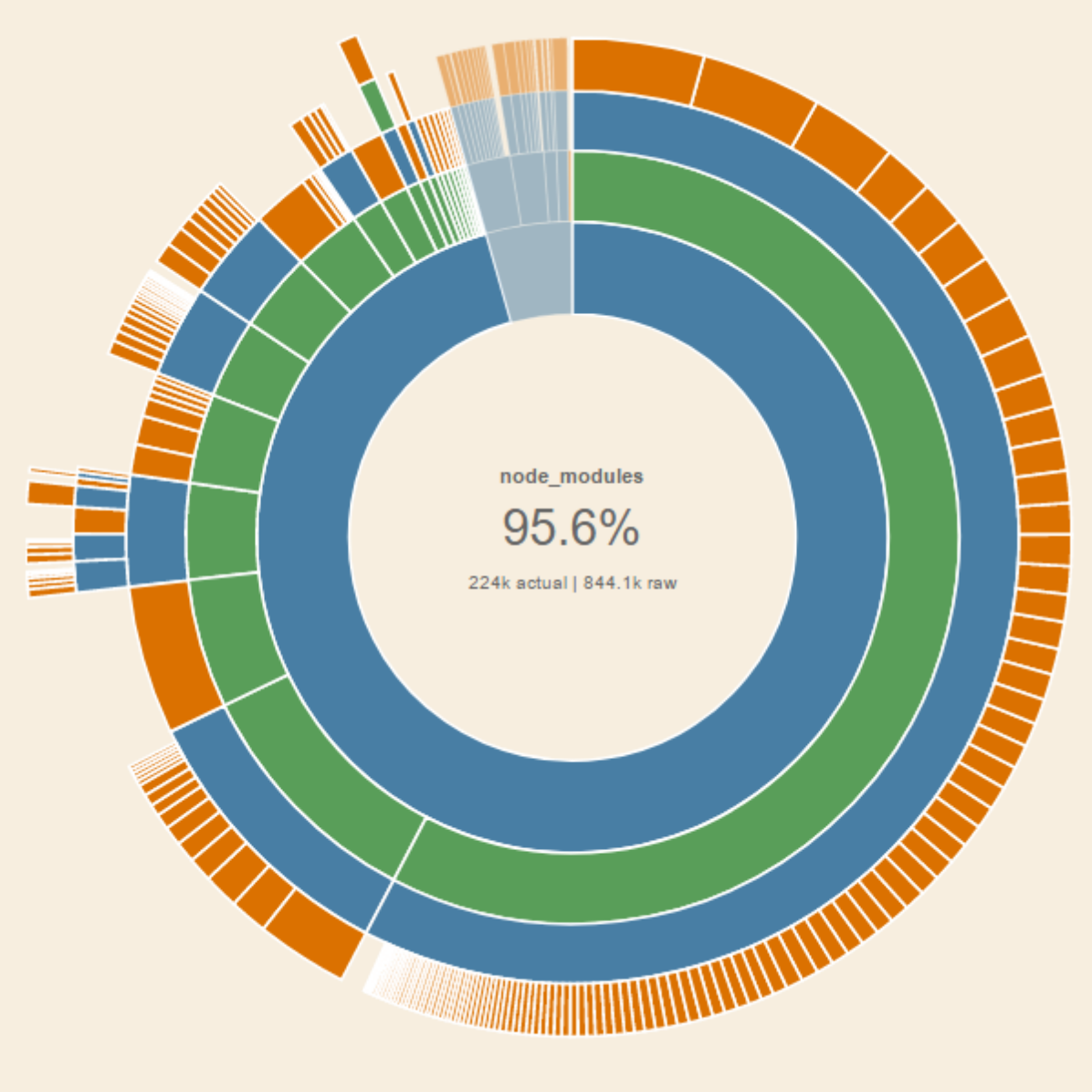
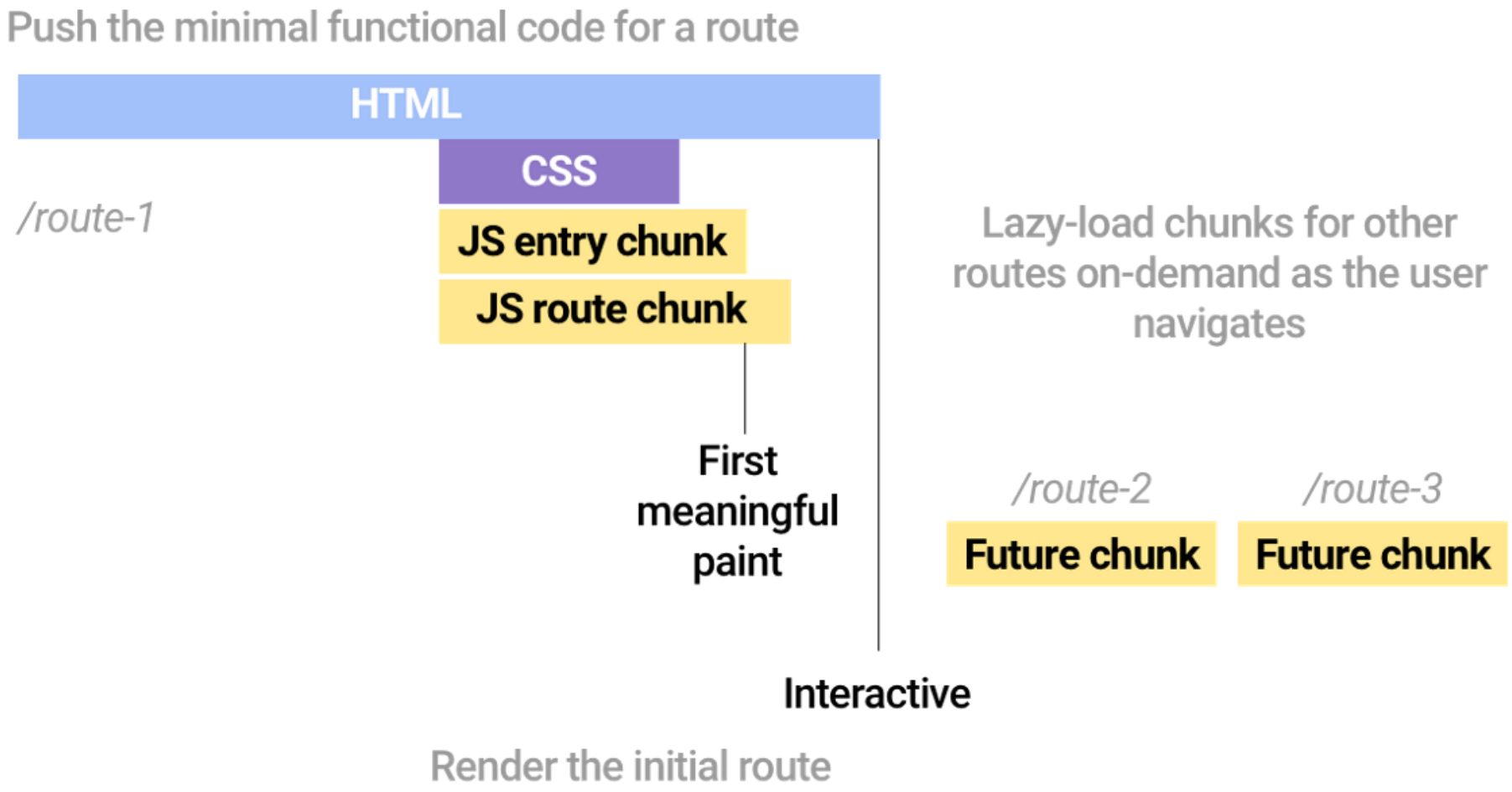
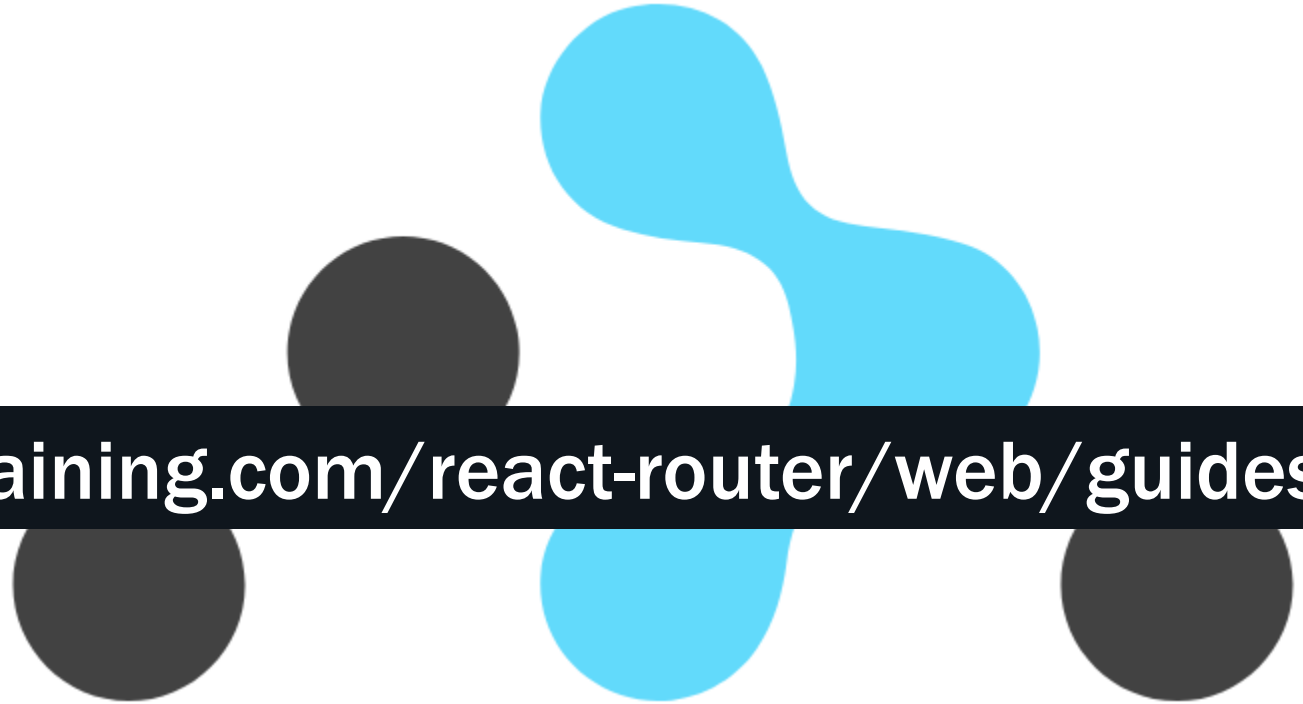


Image compression

```
loaders: [
// ...
  {
    test: /\.(gif|png|jpe?g|svg)$/,
    loaders: [
      'file-loader',
      {
        loader: 'image-webpack-loader',
        query: {
          progressive: true,
          optimizationLevel: 7,
          interlaced: false,
          pngquant: {
            quality: '65-90',
            speed: 4
          }
        }
      }
    ]
  }
]
```

Route-based splitting





https://reacttraining.com/react-router/web/guides/code-splitting

+ bundle-loader

Component-based splitting

```
componentWillMount() {
  // ...
  this.importComponent(componentName);
}

importComponent(componentName) {
  System.import(`components/${componentName}/index.tsx`)
    .then((Component) => {
      this.Component = Component;
      this.forceUpdate();
    })
    .catch((err) => {
      // ...
    });
}
```

react-loadable

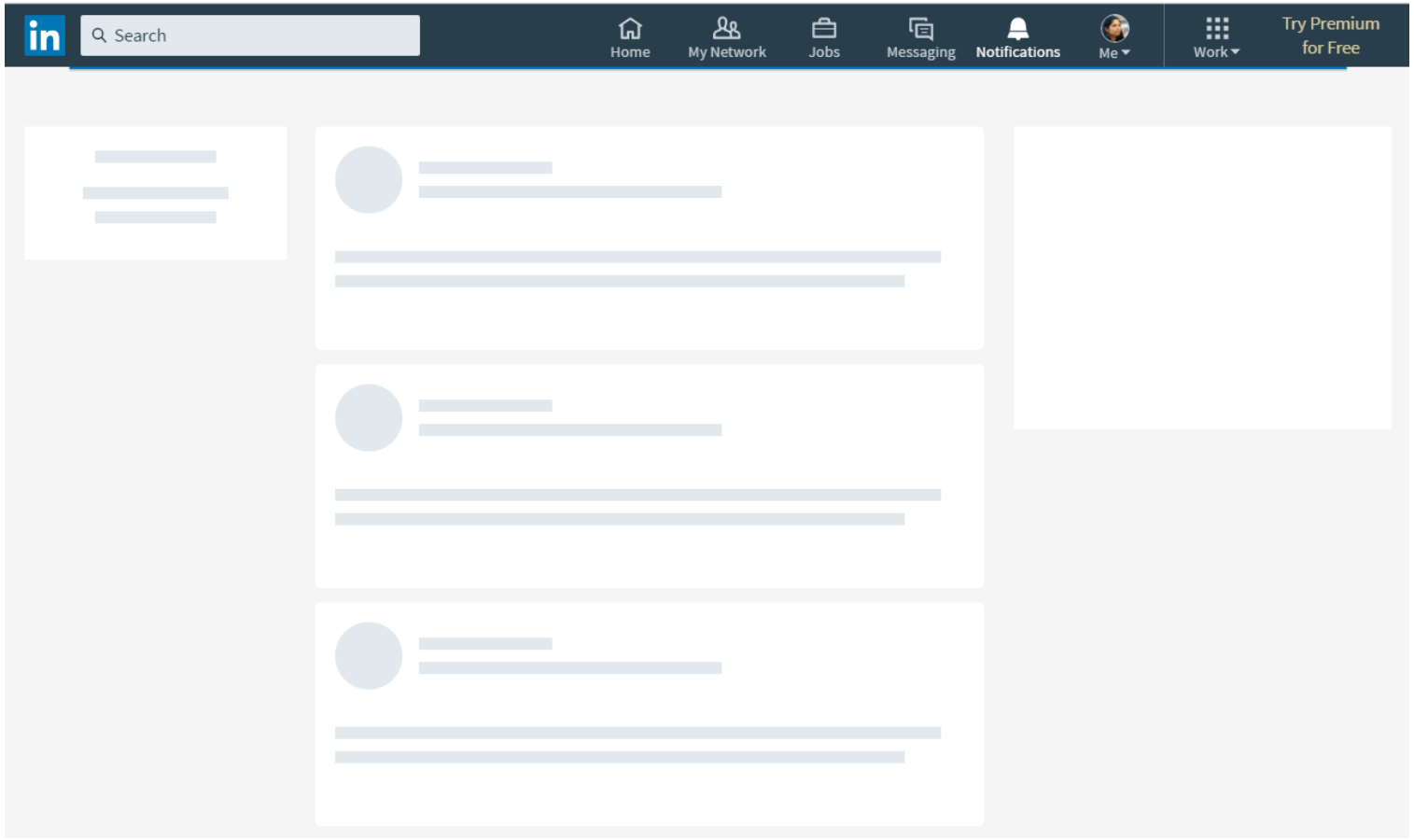
```
import Loadable from 'react-loadable';
import Loading from './my-loading-component';

const LoadableComponent = Loadable({
});

export default class App extends React.Component {
  render() {
    return <LoadableComponent/>;
  }
}
```

http://thejameskyle.com/react-loadable.html

Other optimization propositions

- Gzip compression (compression-webpack-plugin)
- Prepack
- Treeshaking
- React 16

(7/8) “Page transitions don't feel like they block on the network”.



```
<div data-app-placeholder="">
  <div class="app__placeholder">
    <div class="app__placeholder__block--w-40 app__placeholder__block-text"></div>
    <div class="app__placeholder__block-field"></div>
    <div class="app__placeholder__block--w-60 app__placeholder__block-text"></div>
    <div class="app__placeholder__block-field"></div>
    <div class="app__placeholder__block--w-20 app__placeholder__block-text"></div>
    <div class="app__placeholder__block-field"></div>
    <div class="app__placeholder__block-spacing"></div>
    <div class="app__placeholder__block--w-20 app__placeholder__block-text"></div>
    <div class="app__placeholder__block-text"></div>
    <div class="app__placeholder__block--w-60 app__placeholder__block-text"></div>
    <div class="app__placeholder__block--w-80 app__placeholder__block-text"></div>
    <div class="app__placeholder__block--w-40 app__placeholder__block-text"></div>
    <div class="app__placeholder__block--w-20 app__placeholder__block-text"></div>
    <div class="app__placeholder__block-spacing"></div>
    <div class="app__placeholder__block--w-20 app__placeholder__block-text"></div>
    <div class="app__placeholder__block--w-40 app__placeholder__block-field"></div>
    <div class="app__placeholder__block--w-60 app__placeholder__block-text"></div>
    <div class="app__placeholder__block--w-40 app__placeholder__block-field"></div>
    <div class="app__placeholder__block-spacing"></div>
    <div class="app__placeholder__block-field"></div>
  </div>
</div>
```

```
  render() {
    const { title, tags, brief, created, updated, isFull } = this.props;
    const { loading } = this.state;

    return (
      <div className="entry">
        {loading &&
          <LoadingIndicator />}
        {!loading &&
          <div>
            <Entry
              ...
            />
          </div>}
      </div>
    );
  }
```

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(8/8) “All app URLs load while offline”

Service Worker

- Runs in the background
- Separate from web page
- Doesn’t need user action

usage

- Caching
- Push notifications
- Background sync

Service Workers - WD

Global 65.22% + 8.44% = 73.67%

Method that enables applications to take advantage of persistent background processing, including hooks to enable bootstrapping of web applications while offline.

Current aligned | Usage relative | Date relative | Show all

IE	Edge *	Firefox	Chrome	Safari	iOS Safari *	Opera Mini *	Chrome for Android	UC Browser for Android	Samsung Internet
			49		10.2				4
	[2] 15	56	61	10.1	10.3				5
11	[2] 16	57	62	11	11.2	all	62	11.4	6.2
	[2] 17	58	63	[4] TP					
		59	64						
		60	65						

Notes | Known issues (0) | Resources (8) | Feedback

Details on partial support can be found on is ServiceWorker Ready?
MS Edge status: In Development
WebKit status: In Development

[2] Available behind the "Enable service workers" flag

[4] Can be enabled via the "Experimental Features" developer menu

Service Worker lifetime

- Registration
- Installation
- Activation
- Idle

Service Worker registration

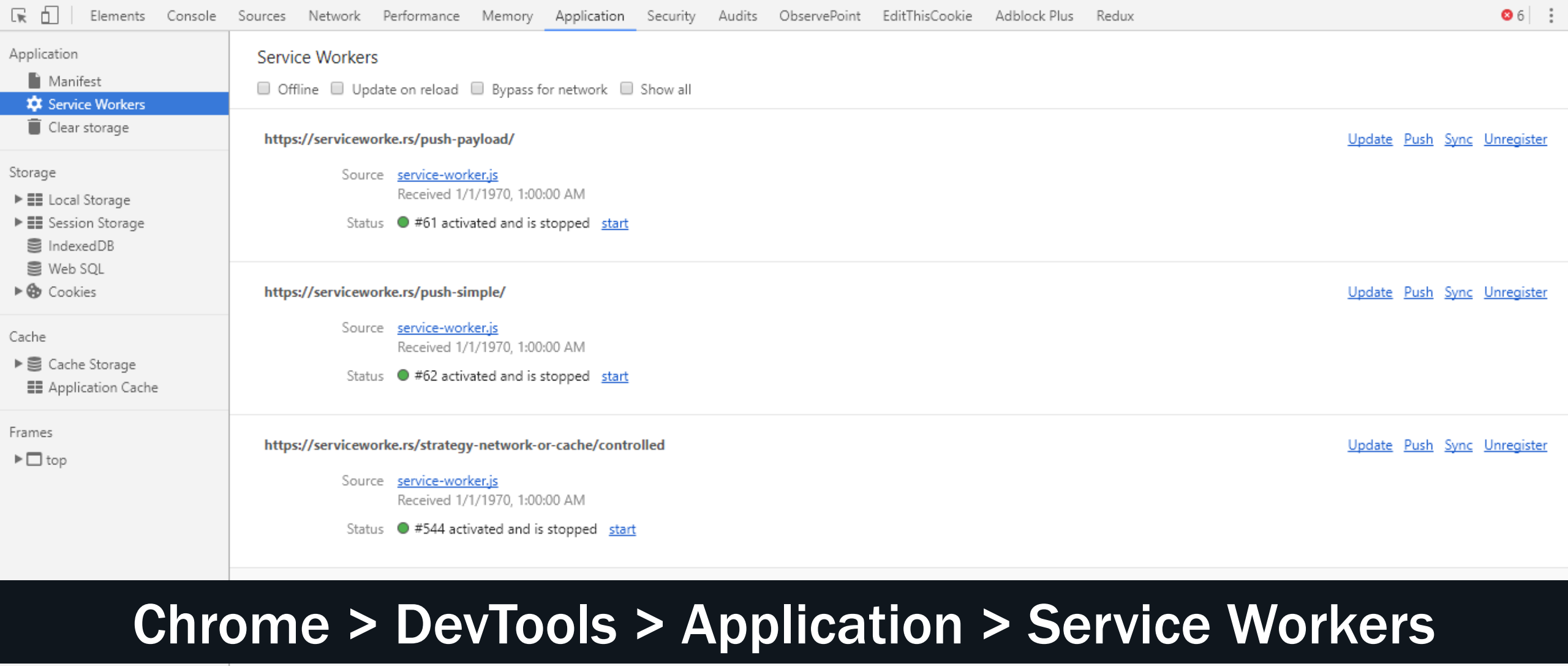
```
1   export class Blog extends React.Component {
2     componentDidMount() {
3       if ('serviceWorker' in navigator) {
4         navigator.serviceWorker.register('/sw.js').then((registration) => {
5           console.log('ServiceWorker registration successful with scope: ', registration.scope);
6         }, (error) => {
7           console.log('ServiceWorker registration failed: ', error);
8         });
9       }
10    }
11
12    // ...
13  }
```

Service Worker installation

```
1   const cacheName = 'soofka-pl-cache-1507666234610';
2   const staticUrls = [
3     '/',
4     '/js/static/disqus.js',
5     '/js/static/googleAnalytics.js',
6     '/styles/normalize.css',
7   ];
8
9   self.addEventListener('install', (event) => {
10    event.waitUntil(
11      caches.open(cacheName)
12        .then((cache) => {
13          console.log(`Adding to cache ${cacheName} files ${urlsToCache}`);
14          return cache.addAll(staticUrls);
15        })
16    );
17  });
```

Service Worker activation

```
1   self.addEventListener('activate', (event) => {
2     const cacheWhitelist = [cacheName];
3     event.waitUntil(
4       caches.keys().then((cacheNames) => {
5         return Promise.all(
6           cacheNames.map((cacheName) => {
7             if (cacheWhitelist.indexOf(cacheName) === -1) {
8               console.log(`Deleting cache ${cacheName}`);
9               return caches.delete(cacheName);
10            }
11          })
12        );
13      })
14    );
15  });
```



Chrome > DevTools > Application > Service Workers

ServiceWorker

Open DevTools window and pause JavaScript execution on Service Worker startup for debugging.

Registrations in:

Scope: https://application-77my.com/
Registration ID: 20
Active worker:
Installation Status: ACTIVATED
Running Status: STOPPED
Fetch handler existence: DOES_NOT_EXIST
Script: https://application-77my.com/pusherSW.js
Version ID: 349
Renderer process ID: 0
Renderer thread ID: -1
DevTools agent route ID: -2
Log:

chrome://serviceworker-internals/

Scope: https://checkin.si.amadeus.net/static/PRD/LO/
Registration ID: 24
Active worker:
Installation Status: ACTIVATED
Running Status: STOPPED
Fetch handler existence: EXISTS
Script: https://checkin.si.amadeus.net/static/PRD/LO/sw.js
Version ID: 408
Renderer process ID: 0
Renderer thread ID: -1
DevTools agent route ID: -2
Log:

Unregister Start

Service Worker custom caching

```
1   self.addEventListener('fetch', function(event) {
2     event.respondWith(
3       caches.match(event.request)
4         .then(function(response) {
5           // Cache hit - return response
6           if (response) {
7             return response;
8           }
9           return fetch(event.request);
10        }
11      )
12    );
13  });
```

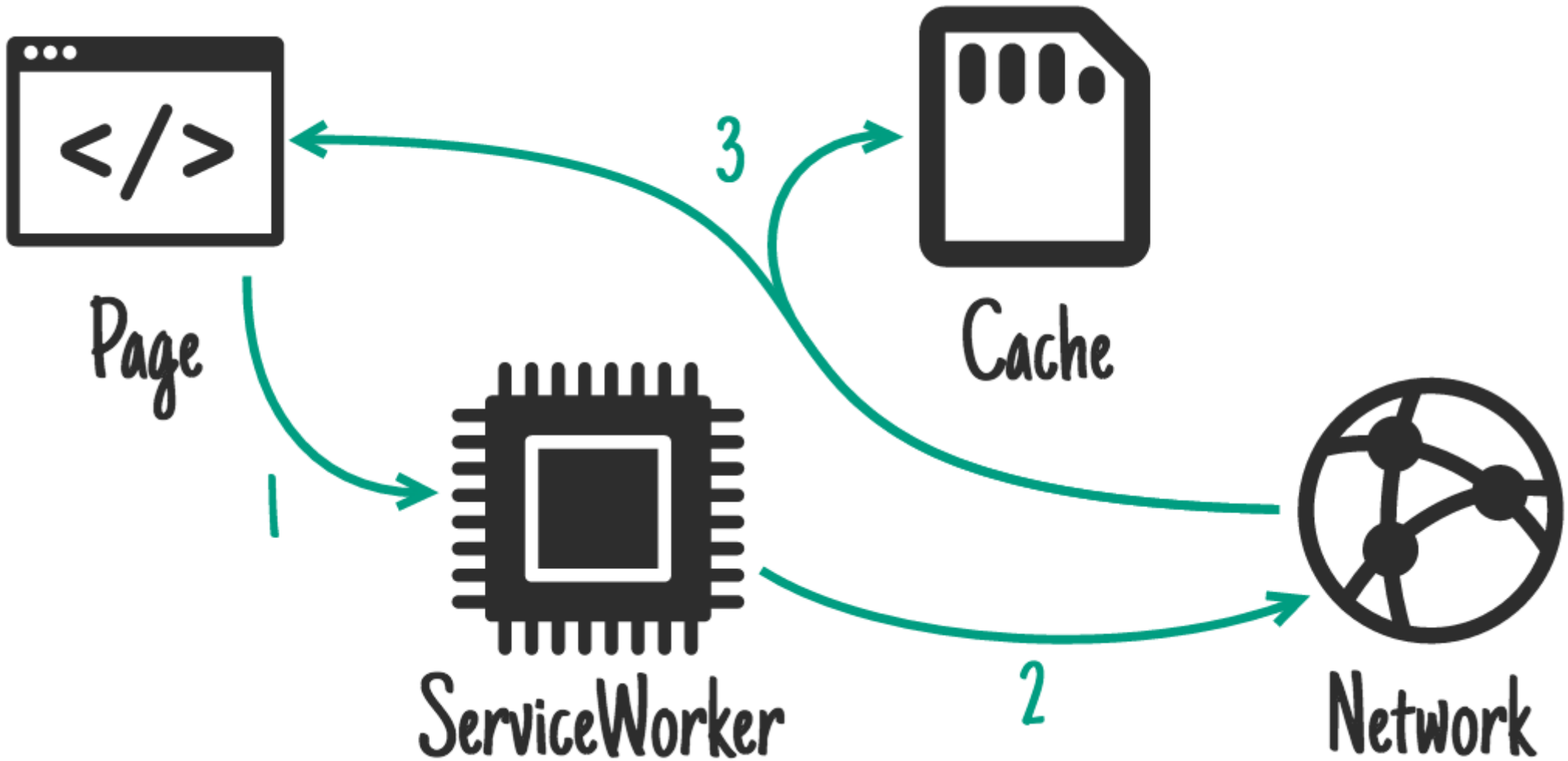
Caching strategies – resources

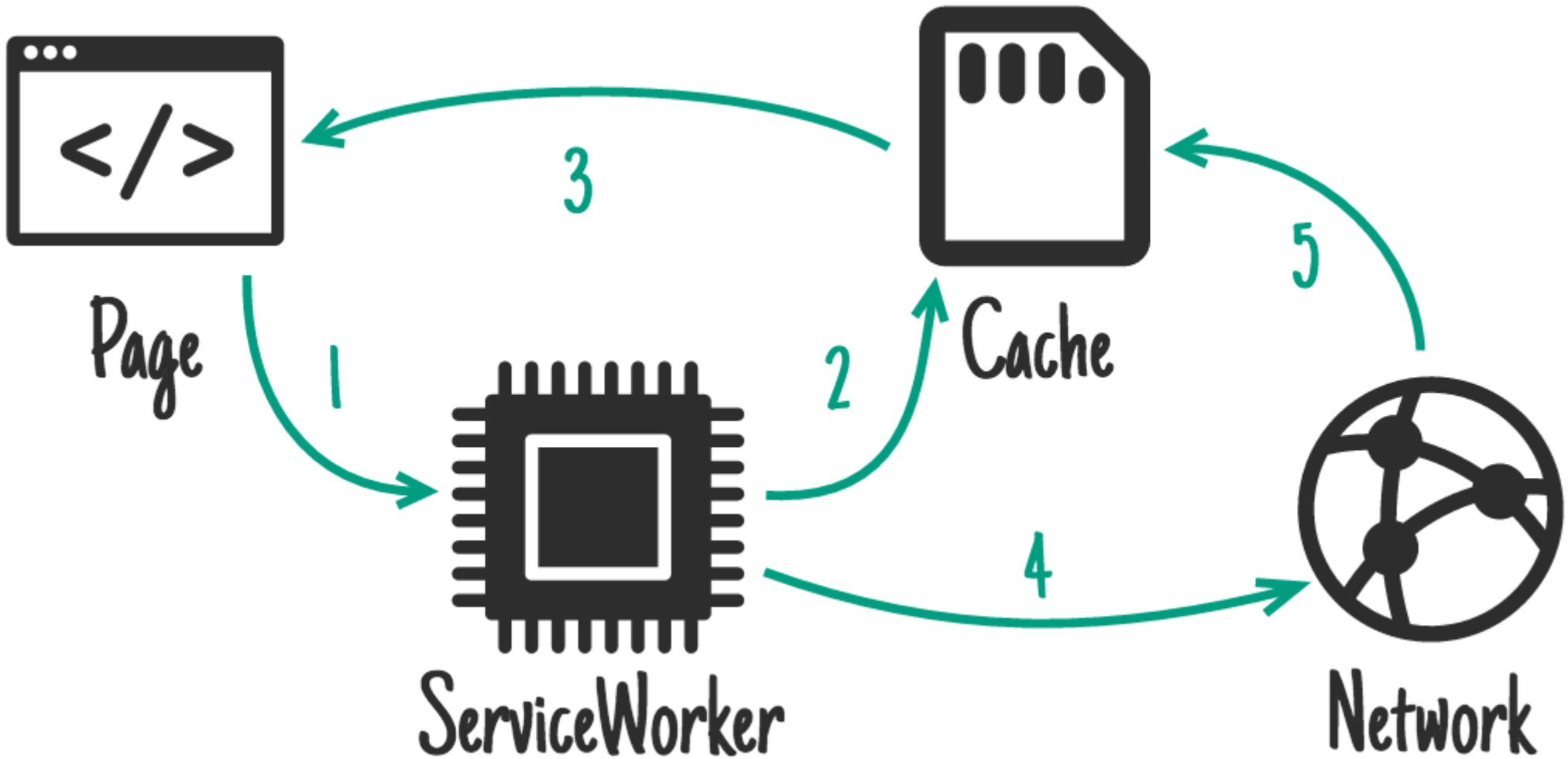
- Jake Archibald's „Offline Cookbook"

  https://developers.google.com/web/fundamentals/instant-and-offline/offline-cookbook

- Service Worker Cookbook

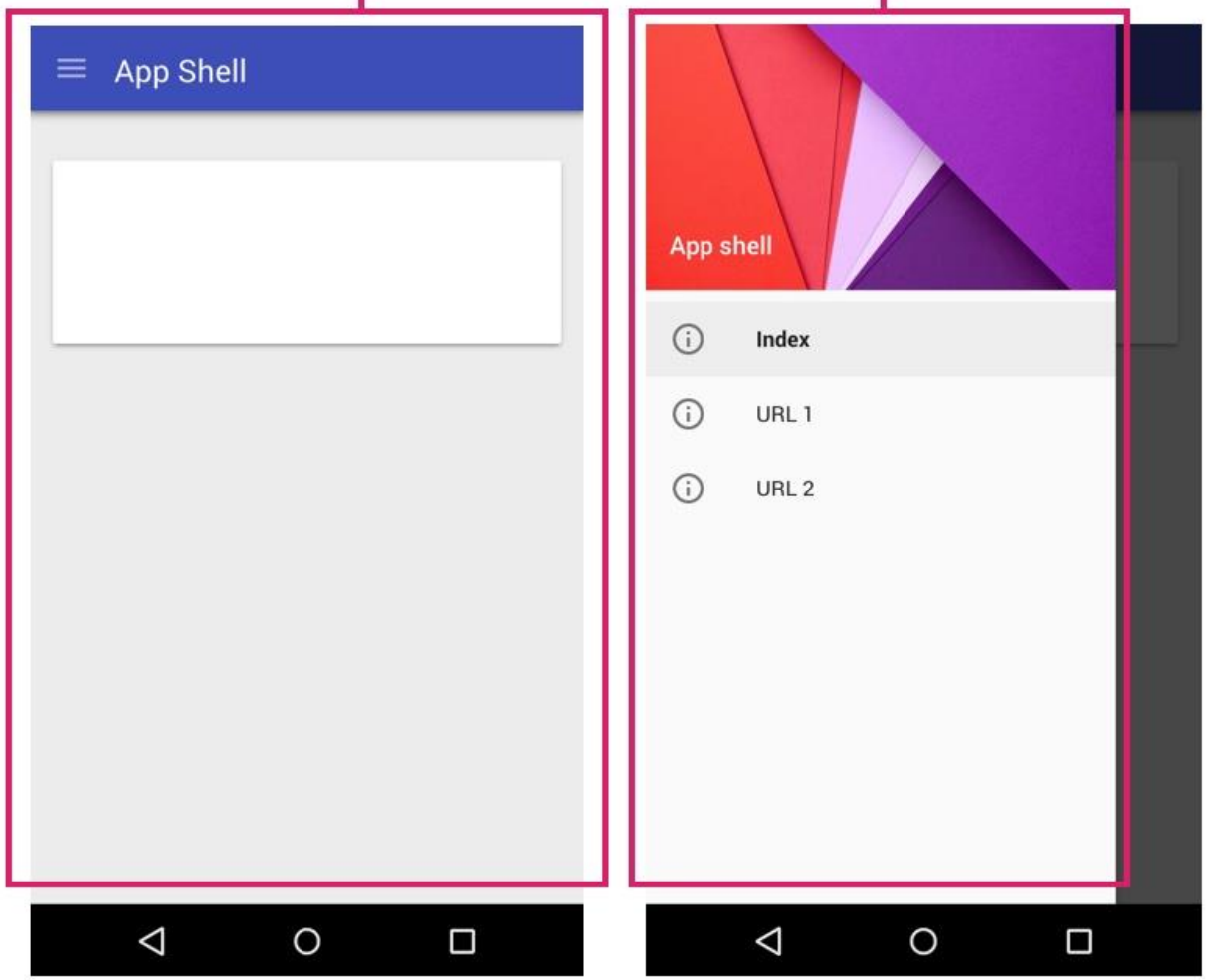
  https://serviceworke.rs


</>
Page
3
Cache
1
ServiceWorker
2
Network


Page
ServiceWorker
Cache
Network
1
2
3
4
5

application shell

content



Cached shell loads **instantly** on repeat visits.

Dynamic content then populates the view

```
self.addEventListener('fetch', (event) => {
  if (dynamicUrls.includes(event.request)) {
    event.respondWith(
      networkOrCache(event.request)
        .catch(() => displayError())
    )
  } else {
    event.respondWith(
      cacheOrNetwork(event.request)
        .catch(() => displayError())
    )
  }
});

const networkOrCache = (request) => (
  fromNetwork(request).catch(() => (
    fromCache(request)
  ))
);

const cacheOrNetwork = (request) => (
  fromCache(request).catch(() => (
    fromNetwork(request)
  ))
);
```

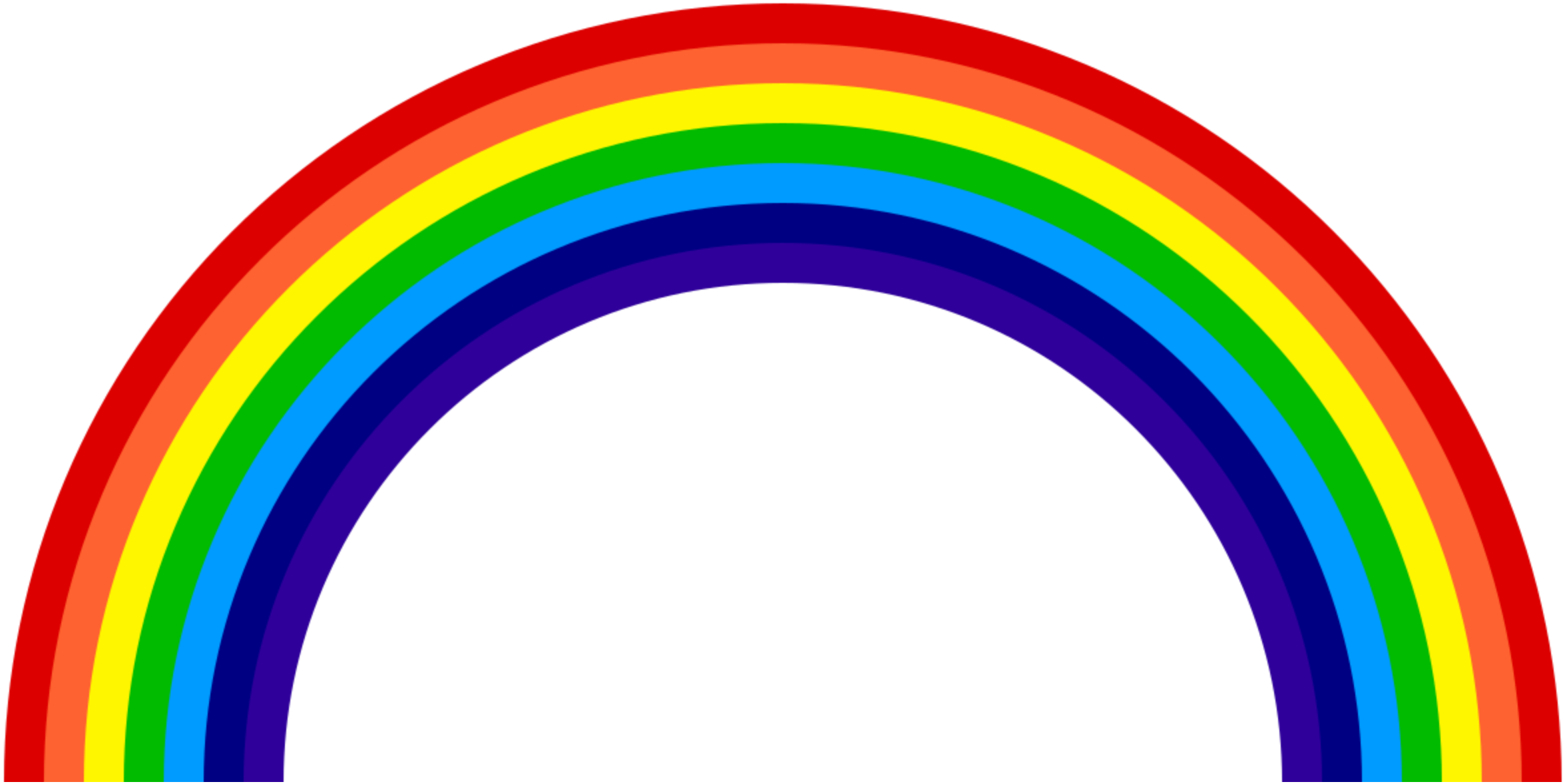
```
const fromCache = (request) => (
  caches.open(cacheName).then((cache) => (
    cache.match(request).then((response) => (
      response || Promise.reject('request-not-available')
    ))
  ))
);

const fromNetwork = (request) => (
  fetch(request).then((response) => {
    if (response.ok) {
      updateCache(request, response);
      return response;
    }
    return Promise.reject('request-not-available')
  })
);

const updateCache = (request, response) => (
  caches.open(cacheName).then((cache) => (
    cache.put(request, response.clone())
      .catch((error) => logError(cache, error)))
  )
);
```

How to implement Service Worker

- Vanilla JS code
- sw-precache, sw-toolbox (libraries)
- sw-precache-webpack-plugin, offline-plugin (plugins)
- create-react-app (boilerplates)



Further considerations

- Background sync (service worker)
- Queue of offline actions (redux-offline)

Roadmap

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4. **Optional**
    - Push notifications

Exemplary checklist

1. Indexability & social
2. User experience
3. Performance
4. Caching
5. Push notifications
6. Additional features

“Site's content is indexed by Google”

- Transpilation
- Polyfills

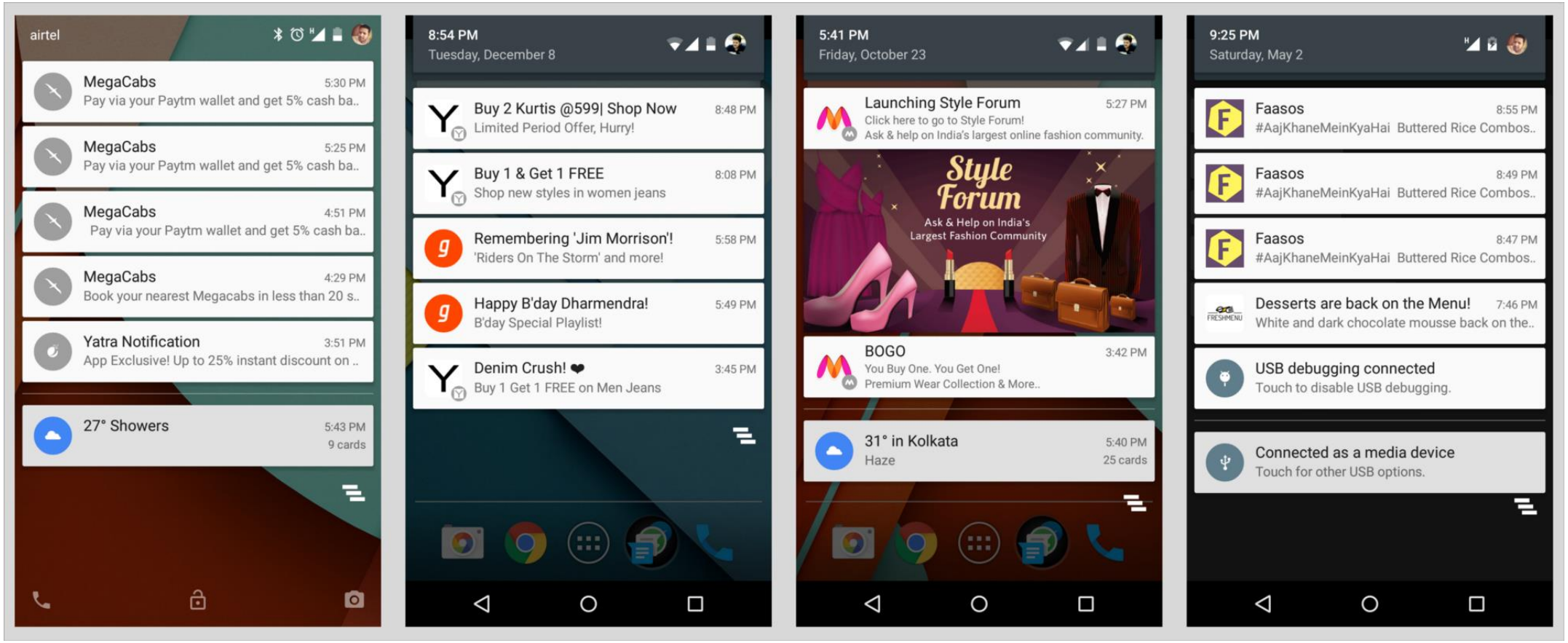
```
loaders: [
  {
    test: /\.jsx?$/,
    exclude: /node_modules/
    // ...
  }
],
// ...
]
```

https://www.google.com/webmasters/tools/googlebot-fetch

Roadmap

1. Introduction
2. Fundamentals
3. Performance
    - Offline support
4. Optional
    - **Push notifications**

Push notifications



Can I use web notifications ?

Settings

1 result found

Web Notifications - LS

Global 40.05% + 2.38% = 42.44%

unprefixed: 40.05%

Method of alerting the user outside of a web page by displaying notifications (that do not require interaction by the user).

Current aligned | Usage relative | Date relative | Show all

IE	Edge *	Firefox	Chrome	Safari	iOS Safari *	Opera Mini *	Chrome for Android	UC Browser for Android	Samsung Internet
			49		10.2				4
	15	56	61	10.1	10.3				[2] 5
11	16	57	62	11	11.2	all	[2] 62	11.4	[2] 6.2
	17	58	63	TP					
		59	64						
		60	65						

Notes | Known issues (3) | Resources (10) | Feedback

[2] Chrome for Android supports notifications via the Push API but not the Web Notifications API.

Push API - WD

Global 72.23% + 1.18% = 73.41%

API to allow messages to be pushed from a server to a browser, even when the site isn't focused or even open in the browser.

Current aligned | Usage relative | Date relative | Show all

IE	Edge *	Firefox	Chrome	Safari	iOS Safari *	Opera Mini *	Chrome for Android	UC Browser for Android	Samsung Internet
			1 2 49		10.2				4
	15	2 56	2 61	3 10.1	10.3				5
11	16	2 57	2 62	3 11	11.2	all	62	11.4	6.2
	17	2 58	2 63	3 TP					
		2 59	2 64						
		2 60	2 65						

Notes | Known issues (0) | Resources (6) | Feedback

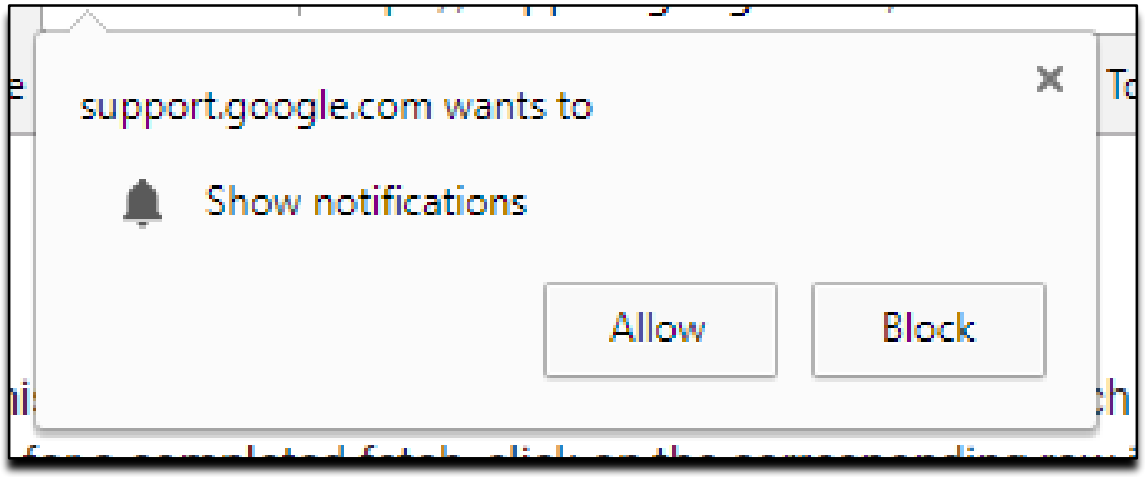
MS Edge status: In Development

1 Partial support refers to not supporting `PushEvent.data` and `PushMessageData`

2 Requires full browser to be running to receive messages

3 Safari supports a custom implementation https://developer.apple.com/notifications/safari-push-notifications/. WWDC video by apple : https://developer.apple.com/videos/play/wwdc2013/614/

Notification permission




```
1   Notification.requestPermission()
2     .then((result) => {
3       // ...
4     });
```

https://developer.mozilla.org/en-US/docs/Web/API/Notification

„Provides controls to enable and disable notifications”

```
1   navigator.permissions.revoke({ name: 'notifications' })
2     .then((result) => {
3       // ...
4     });
5
```

https://developer.mozilla.org/en-US/docs/Web/API/Permissions

Sending notification

```
1   if ('serviceWorker' in navigator) {
2     navigator.serviceWorker.register('/sw.js').then((swRegistration) => {
3       swRegistration.showNotification('ServiceWorker registration success');
4     }, (error) => {
5       console.log('ServiceWorker registration failure: ', error);
6     });
7   }
```

Notification content

```
{
  "body": "Is it progiressive enoug?",
  "icon": "images/question.png",
  "vibrate": [200, 100, 200, 100, 200, 100, 400],
  "tag": "request",
  "actions": [
    { "action": "yes", "title": "Yes", "icon": "images/yes.png" },
    { "action": "no", "title": "No", "icon": "images/no.png" }
  ]
}
```

Handling notification actions

```
1   self.addEventListener('notificationclose', (event) => {
2     console.log('Notification closed');
3   });
4
5   self.addEventListener('notificationclick', (event) => {
6     console.log('Notification clicked', event.notification);
7
8     switch (event.action) {
9       case 'yes':
10        console.log('It is progressive enough');
11        break;
12      case 'no':
13        console.log(':-(');
14        break;
15      default:
16        console.log(`Unknown action clicked: '${event.action}'`);
17        break;
18    }
19  });
```

Push API

- Require Push Service
- Require separate subscription
- Enable notifications triggered when website is off

Back-end setup

```
var webPush = require('web-push');

webPush.setGCMAPIKey(process.env.GCM_API_KEY);

module.exports = function(app, route) {
  app.post(route + 'register', function(req, res) {
    res.sendStatus(201);
  });

  app.post(route + 'sendNotification', function(req, res) {
    setTimeout(function() {
      webPush.sendNotification({
        endpoint: req.body.endpoint,
        TTL: req.body.ttl,
        keys: {
          p256dh: req.body.key,
          auth: req.body.authSecret
        }
      }, req.body.payload)
      .then(function() {
        res.sendStatus(201);
      })
      .catch(function(error) {
        console.log(error);
        res.sendStatus(500);
      });
    }, req.body.delay * 1000);
  });
};
```

Back-end setup

```php
$notifications = array(
    array(
        'endpoint' => 'https://updates.push.services.mozilla.com/push/abc...', // Firefox 43+
        'payload' => 'hello !',
        'userPublicKey' => 'BPcMbnWQL5GOYX/5LKZXT6sLmHiMsJSiEvIFvfcDvX7IZ9qqtq68onpTPEYmyxSQNi
        'userAuthToken' => 'CxVX6QsVToEGEcjfYPqXQw==', // base 64 encoded, should be 24 chars
    ), array(
        'endpoint' => 'https://android.googleapis.com/gcm/send/abcdef...', // Chrome
        'payload' => null,
        'userPublicKey' => null,
        'userAuthToken' => null,
    ), array(
        'endpoint' => 'https://example.com/other/endpoint/of/another/vendor/abcdef...',
        'payload' => '{msg:"test"}',
        'userPublicKey' => '(stringOf88Chars)',
        'userAuthToken' => '(stringOf24Chars)',
    ),
);
```

Push notification permission

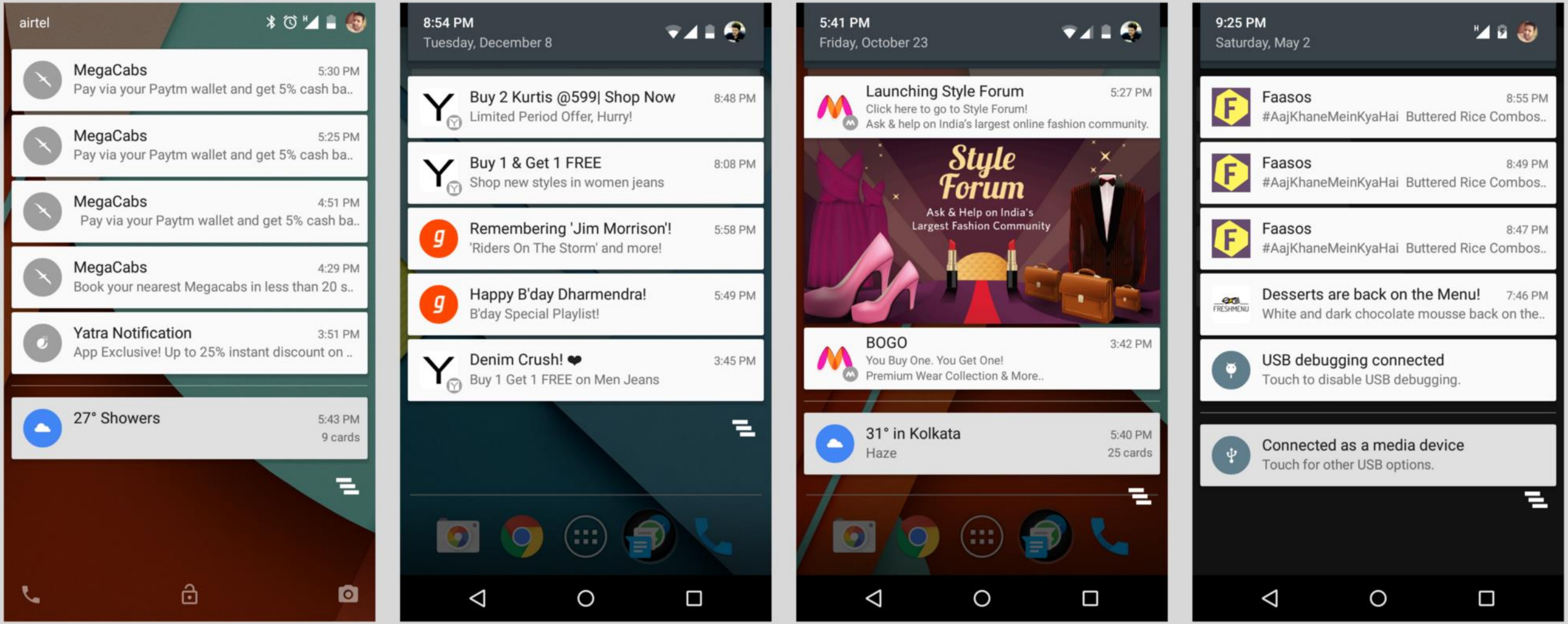
```
navigator.serviceWorker.register('/sw.js').then((serviceWorkerRegistration) => {
  var options = {
    userVisibleOnly: true,
    applicationServerKey: applicationServerKey
  };

  serviceWorkerRegistration.pushManager.subscribe(options)
    .then((pushSubscription) => {
      console.log(pushSubscription.endpoint);
    }, (error) => {
      console.log(error);
    });

  serviceWorkerRegistration.pushManager.subscribe(options)
    .then((pushSubscription) => {
        // ...
    });
});
```

Receiving push event

```
1   self.addEventListener('push', (event) => {
2     var options = {
3       body: 'This notification was generated from a push!',
4       icon: 'images/example.png',
5       vibrate: [100, 50, 100],
6       data: {
7         dateOfArrival: Date.now(),
8         primaryKey: '2'
9       },
10      actions: [
11        {action: 'explore', title: 'Explore this new world',
12          icon: 'images/checkmark.png'},
13        {action: 'close', title: 'Close',
14          icon: 'images/xmark.png'},
15      ]
16    };
17    event.waitUntil(
18      self.registration.showNotification('Hello world!', options)
19    );
20  });
```


airtel
MegaCabs 5:30 PM
Pay via your Paytm wallet and get 5% cash ba..
MegaCabs 5:25 PM
Pay via your Paytm wallet and get 5% cash ba..
MegaCabs 4:51 PM
Pay via your Paytm wallet and get 5% cash ba..
MegaCabs 4:29 PM
Book your nearest Megacabs in less than 20 s..
Yatra Notification 3:51 PM
App Exclusive! Up to 25% instant discount on ..
27° Showers 5:43 PM
9 cards
8:54 PM
Tuesday, December 8
Buy 2 Kurtis @599| Shop Now 8:48 PM
Limited Period Offer, Hurry!
Buy 1 & Get 1 FREE 8:08 PM
Shop new styles in women jeans
Remembering 'Jim Morrison'! 5:58 PM
'Riders On The Storm' and more!
Happy B'day Dharmendra! 5:49 PM
B'day Special Playlist!
Denim Crush! ❤ 3:45 PM
Buy 1 Get 1 FREE on Men Jeans
5:41 PM
Friday, October 23
Launching Style Forum 5:27 PM
Click here to go to Style Forum!
Ask & help on India's largest online fashion community.
Style Forum
Ask & Help on India's
Largest Fashion Community
BOGO 3:42 PM
You Buy One. You Get One!
Premium Wear Collection & More..
31° in Kolkata 5:40 PM
Haze
25 cards
9:25 PM
Saturday, May 2
Faasos 8:55 PM
#AajKhaneMeinKyaHai Buttered Rice Combos..
Faasos 8:49 PM
#AajKhaneMeinKyaHai Buttered Rice Combos..
Faasos 8:47 PM
#AajKhaneMeinKyaHai Buttered Rice Combos..
Desserts are back on the Menu! 7:46 PM
White and dark chocolate mousse back on the..
USB debugging connected
Touch to disable USB debugging.
Connected as a media device
Touch for other USB options.